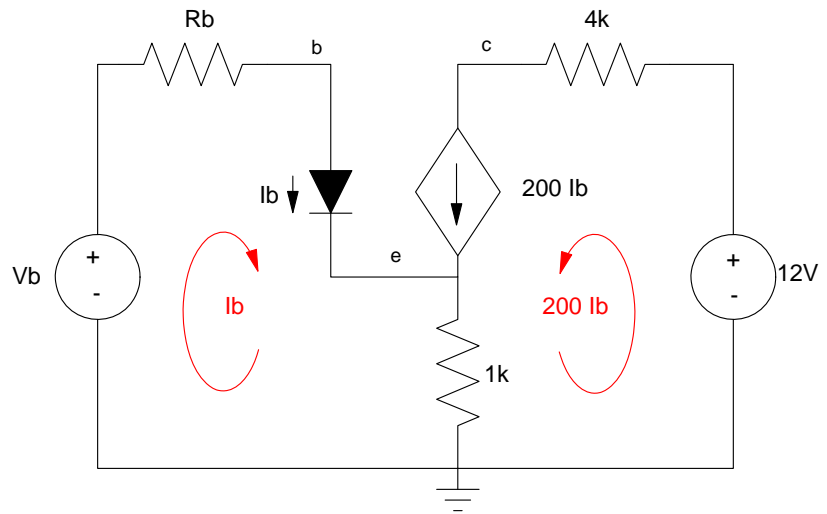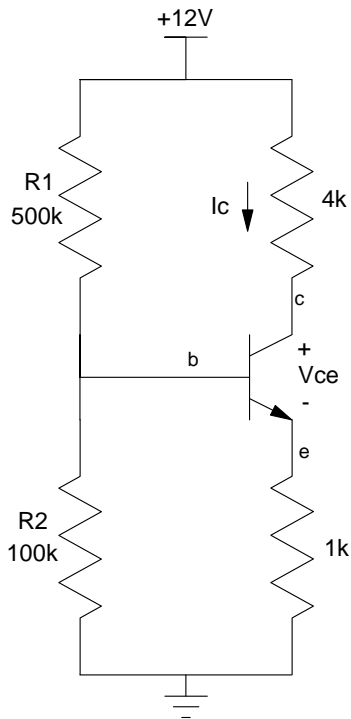# ECE 321 - Quiz #4 - Name _____

Common Emitter - Common Base - Common Collector Amplifiers. May 2, 2019

1) Q-Point Analysis. Determine the Thevenin equivalent for R1 and R2 (Vb and Rb) and determine the Q-point for the following transistor circuit. Assume ideal silicon transistors:
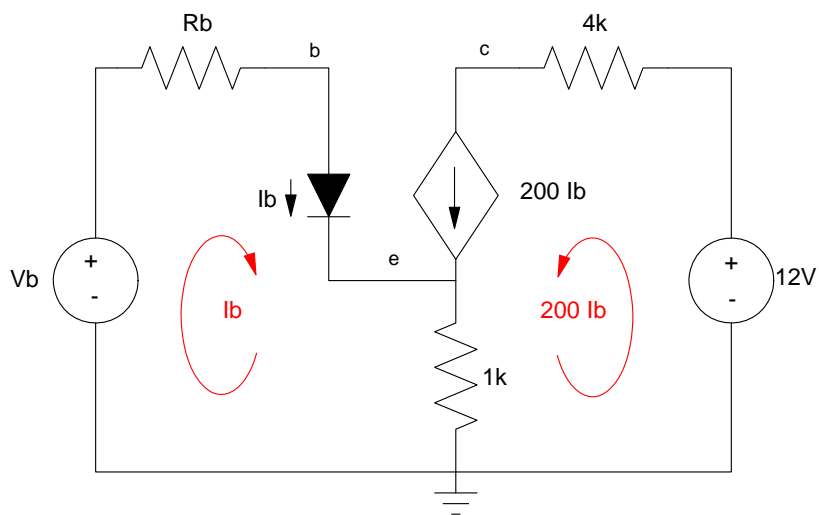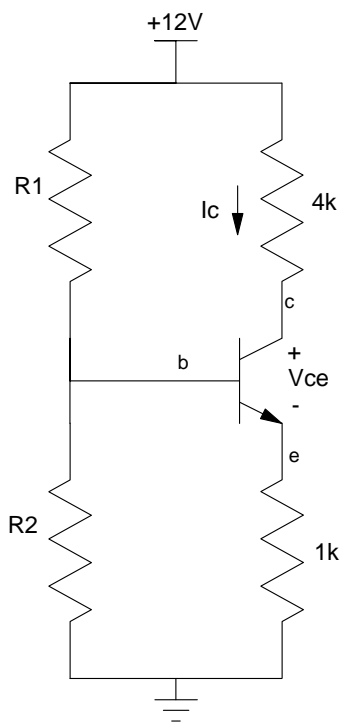
- $V_{be} = 0.7V$
- $\beta = 200$

Vb	Rb	Vce	Ic

2) Q-Point Design. Find Rb and Vb and the corresponding R1 and R2 so that
- The Q-point is stabilized for variations in β (i.e. $(1+\beta)R_e \gg R_b$)
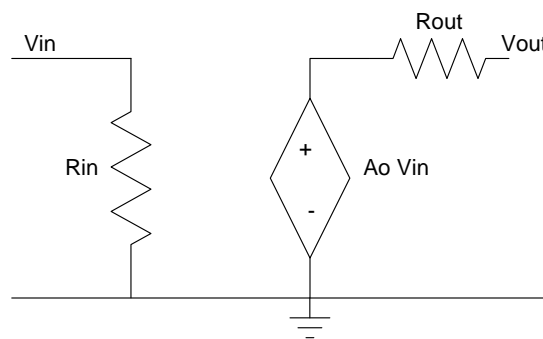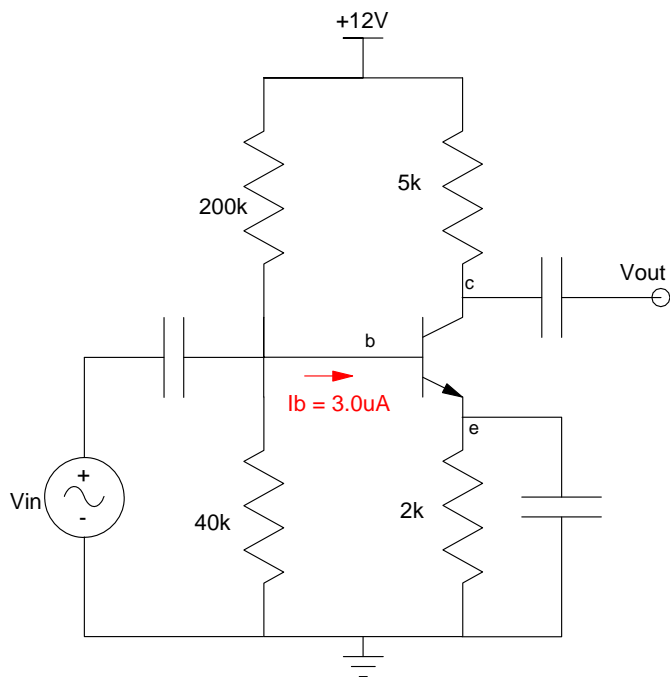- $V_{ce} = 6.0V$

R1	R2	Vb	Rb

3) AC Anaysis: Common Emitter.
- Draw the small signal model for the following common emitter amplifier. Assume $r_f = 17.3k$
- Determine the 2-port model for this common emitter amplifier

Small-Signal Model	Rin	Ao	Rout
draw			

3) AC Anaysis: Common Base.
- Draw the small signal model for the following common base amplifier. Assume $r_f = 17.3k$
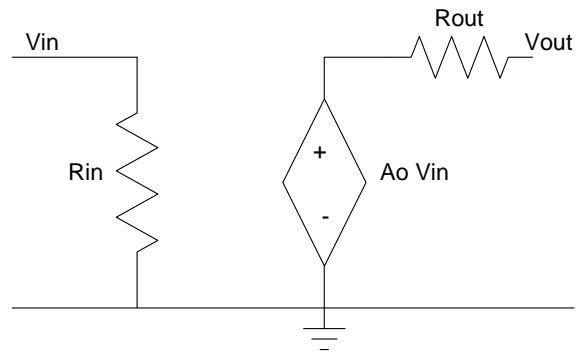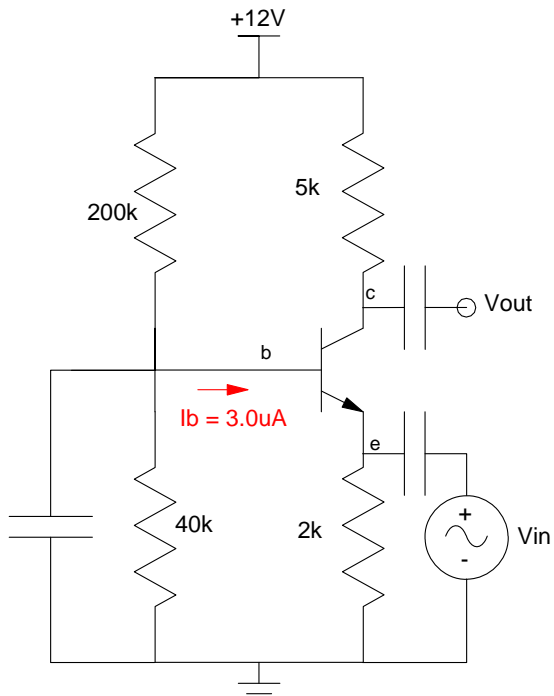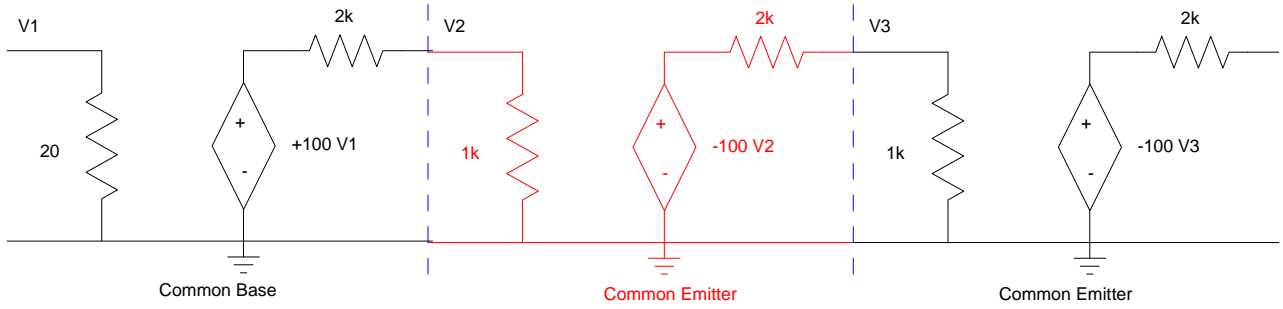- Determine the 2-port model for this common emitter amplifier

Small-Signal Model	Rin	Ao	Rout
draw			

+12V

200k

5k

c

Vout

b

Ib = 3.0uA

e

40k

2k

+
~
-

Vin

Vin

Rin

Rout

Vout

+

-

Ao Vin

5) Multi-Stage Amplifier: Determine the 2-port model for the following 3-stage amplifier:

CB : CE : CE

Rin	Ai	Rout	Ao

Socialism vs. Capitalism Bonus!   What does capitalism say about how wealth is distributed?